CLAIMS

What is claimed is:

1.   A device comprising:

   a flexible substrate having at least one flat or substantially flat surface; and

5 a source of vibrational energy that can be applied to said substrate,

   wherein the device is capable of translational motion along a surface.

2.   The device of Claim 1, wherein the vibrational energy is harmonic.

3.   The device of Claim 2, wherein the vibrational energy causes the substrate to flex in harmonic fashion.

10   4.   The device of Claim 2, wherein the source of harmonic vibration imparts vibrations to said substrate to cause said substrate to move in translational fashion.

5.   The device of Claim 1 which can adhere to a surface other than horizontal.

6.   The device of Claim 5, wherein the surface is vertical.

7.   The device of Claim 5, wherein the surface is upside down.

15   8.   The device of Claim 1, wherein a change in the frequency of the vibrational energy causes the direction of the motion of the device to change.

9.   The device of Claim 1, wherein the vibrational energy is imparted to the substrate to cause the device to adhere to the surface.

10.   A device capable of translational motion comprising:

a flexible substrate having at least one flat or substantially flat surface; and a source of harmonic vibration in communication with said substrate.

11.   The device of Claim 10, wherein the source of harmonic vibration imparts vibrations to said substrate to cause said substrate to move in translational fashion.

12.   The device of Claim 10, which can adhere to a surface other than horizontal.

13.   The device of Claim 12, wherein the surface is vertical.

14.   The device of Claim 12, wherein the surface is upside down.

15.   The device of Claim 10, wherein the source of harmonic vibration is attached to the substrate.

16.   A device comprising:

a flexible substrate or surface; and

a source of vibrational energy that can be applied to said substrate or surface,

wherein the device is capable of translational motion along a surface or through a fluid.

17.   The device of Claim 16, wherein the vibrational energy is harmonic.

18.   The device of Claim 17, wherein the vibrational energy causes the substrate or surface to flex in harmonic fashion.

19.   The device of Claim 17, wherein the source of harmonic vibration imparts vibrations to said substrate or surface to cause said device to move in translational fashion.

20.   The device of Claim 16 which can adhere to a surface other than horizontal.

5   21.   The device of Claim 16, wherein a change in the frequency of the vibrational energy causes the direction of the motion of the device to change.

22.   The device of Claim 1, 10, or 16 which also comprises an antisymmetry element.

23.   The device of Claim 22, wherein the antisymmetry element comprises
10   bristles, spines or spicules embedded in a flexible matrix, regular or irregular projections, fins, or a conformable mat.

24.   The device of Claim 23, wherein the antisymmetry element comprises bristles.

25.   A method for imparting translational motion to an object on a surface or in
15   a fluid, said method comprising the steps of:

(a)   vibrating the object to produce harmonic vibration;

(b)   coupling the vibration to the surface or fluid in an asymmetric way to produce translational motion by the object.

26.   A method for imparting translational motion to an object having a substrate
20   or a first surface on a second surface or in a fluid, said method comprising the steps of:

(a)   applying vibrational energy to the object to produce harmonic vibrations in the substrate or first surface; and

(b)   coupling the vibrations to the second surface in an asymmetric way to produce translational motion by the object.

27.   The method of Claim 26, wherein a force in one direction during one part of the wave cycle is not counterbalanced by an equal and opposition force in the other direction.

28.   The method of Claim 25 or 26, wherein an antisymmetry element produces a net force in one direction when averaged over the entire vibratory cycle.